With Respect to the Election, Paragraphs 1-2 of the Office Action:

With respect to the prior election of claims 1-7 for examination on the merits, the Applicant has canceled non-elected claims 8-13 by this Response and Amendment.

With Respect to the Rejections under 35 U.S.C. §102(b), Paragraphs 5-6 of the Office Action:

Claims 1-4 stand rejected under 35 U.S.C. §102(b), as being anticipated by Berlin et al, for the reasons given in paragraphs 5-6 of the Office Action. In response, claim 1 has been amended. The Applicant notes that the limitation "biological molecules" necessarily means that the molecules have biological activity, whereas the limitation "organic molecules," deleted from claim 1 by this amendment, means that the molecules do not have biological activity. This distinction is inherent in the limitations as originally claimed, or the use of the two limitations simultaneously would have been redundant. Berlin et al. does not disclose the use of thiophene oligomers which have at least one functional group able to form a covalent bond with biological molecules, as opposed to organic molecules without biological activity. Therefore, this amendment is believed to obviate this rejection. Claims 2-4 depend on claim 1. Withdrawal of these rejections is hereby requested.

With Respect to the Rejections under 35 U.S.C. §103, Paragraphs 7-9 of the Office Action:

Claims 1-4 stand rejected under 35 U.S.C. §103(a), as being obvious by Berlin et al. in view of Roncucci et al., for the reasons given in paragraphs 7-9 of the Office Action. In response, claim 1 has been amended to include the limitation "without altering the biological activity of the biological molecules." The Roncucci et al. reference teaches using thiophene oligomers to mark biological molecules in such a manner that their biological activity is or can be altered. In one aspect, the present invention includes the discovery that thiophene oligomers not only can be bound to a biological molecule, but that the thiophene oligomers can be bound in a manner that does not alter the biological activity of the bound biological

molecule. Therefore, the amendment to claim 1 is believed to obviate this rejection. Claims 2-4 depend on claim 1. Withdrawal of these rejections is hereby requested.

With Respect to the Allowable Subject Matter, Paragraph 10 of the Office Action:

Claims 5-7 stand objected to as being dependent upon a rejected base claim. New claims 19-21 have been added where claim 19 includes the limitations of originally filed claims 1 and 5, and claims 20 and 21 include the limitations of originally filed claims 6 and 7. Therefore, claims 19-21 are believed to be allowable.

With Respect to New Claims 14-18 and 22-26:

Additionally, new claims 14-18 and 22-26 have been added. Claims 14-17, and claims 22-25 are methods of use claims that are believed to be patentable in view of the patentability of their base claims, claims 1 and 19 respectively. Claims 18 and 26 are composition claims comprising the subject matter of their base claims, claims 1 and 19 respectively. Therefore, claims 14-18 and 22-26 are believed to be patentable without further searching.

CONCLUSION

For the reasons given above, all pending claims, claims 1-7 and 14-26 are now in condition for allowance, and an indication of such is hereby requested. If, however, there remain any issues which can be addressed by telephone, the Examiner is encouraged to contact the undersigned.

For the reason stated above, the Applicant respectfully believes that all pending claims, claims 1-7 and 14-26 are in condition for allowance and a Notice of Allowance is earnestly solicited. If, however, there remain any issues that can be resolved by telephone with the Applicants representative, the Examiner is encouraged to contact the undersigned directly.

A fee of $55.00 is due to cover the one-month extension of time to respond. Enclosed is a check in the amount of $55.00 for payment of the extension of time fee. The Commissioner is hereby authorized to charge any other additional fees associated with this communication, if such fees are due, to Deposit Account No. 19-2090.

Respectfully submitted,

SHELDON & MAK
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Date: May 12, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

Amend the title to:

--Fluorescent Markers Comprising Functionalized Thiophene--.

IN THE CLAIMS:

1. (Amended) Thiophene oligomers characterized in that they have at least one functional group able to form a covalent bond with [organic molecules,] biological molecules [or both,] and are excitable in the visible and ultraviolet light region without altering the biological activity of the biological molecules.

2. (Amended) [Oligomers as in] Thiophene oligomers according to claim 1, [characterized in that they have] comprising between 2 and 5 thiophene rings.

3. (Amended) [Oligomers as in] Thiophene oligomers according to claim 2, [characterized in that there are] comprising between 3 and 4 thiophene rings.

4. (Amended) [Oligomers as in] Thiophene oligomers according to claim 1, [characterized in that] where the functional group is selected from the group consisting of NH2, CHO, COOH, SH and NCS.

5. (Amended) [Oligomers as in] Thiophene oligomers according to claim 4, [characterized in that] where the functional group is NCS.

6. (Amended) [Oligomers as in] Thiophene oligomers according to claim 5, [characterized in that] where the functional group NCS is bound to the oligomer by means of an alkyl spacer comprising from 2 to 4 carbon atoms.

7. (Amended) [Oligomers as in] Thiophene oligomers according to claim 6, [characterized in that] where the alkyl spacer is selected from the group consisting of CH_2CH_2- and $(CH_3)_2Si$-CH_2-.

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

Add new claims 14-26:

14. A method of detecting molecules comprising:

a) providing thiophene oligomers according to claim 1;

b) covalently bonding the thiophene oligomers to the biological molecules; and

c) detecting fluorescence of the bound thiophene oligomers.

15. The method of claim 14, where the biological molecules are selected from the group consisting of proteins, polyclonal antibodies, fractions of polyclonal antibodies, monoclonal antibodies, fractions of monoclonal antibodies, nucleic acids, oligonucleotides, hormones, medicines, drugs, and non-proteic chemical neurotransmitters.

16. The method of claim 14, where detecting fluorescence comprises performing one or more than one procedure selected from the group consisting of spectrometry, spectrofluorimetry, flow and static cytometry, fluorescence microscopy and gel electrophoresis.

17. The method of claim 14, where the thiophene oligomers provided comprise a plurality of thiophene oligomers with different emission frequencies, and where detecting fluorescence comprises simultaneously exciting the thiophene oligomers, through one or more than one emissive radiation source.

18. A conjugate comprising a thiophene oligomer according to claim 1 covalently bound to a biological molecule.

19. Thiophene oligomers excitable in the visible and ultraviolet light region comprising at least one functional NCS group able to form a covalent bond with organic molecules, biological molecules or both.

20. Thiophene oligomers according to claim 19, where the functional NCS group is bound to the oligomer by an alkyl spacer comprising from 2 to 4 carbon atoms.

21. Thiophene oligomers according to claim 20, where the alkyl spacer is selected from the group consisting of CH_2CH_2- and $(CH_3)_2Si$-CH_2-.

22. A method of detecting molecules comprising:

a) providing thiophene oligomers according to claim 19;

b) covalently bonding the thiophene oligomers to the molecules; and

c) detecting fluorescence of the bound thiophene oligomers.

23. The method of claim 22, where the molecules are selected from the group consisting of proteins, polyclonal antibodies, fractions of polyclonal antibodies, monoclonal antibodies, fractions of monoclonal antibodies, nucleic acids, oligonucleotides, hormones, medicines, drugs, and non-proteic chemical neurotransmitters.

24 The method of claim 22, where detecting fluorescence comprises performing one or more than one procedure selected from the group consisting of spectrometry, spectrofluorimetry, flow and static cytometry, fluorescence microscopy and gel electrophoresis.

25. The method of claim 17, where the thiophene oligomers provided comprise a plurality of thiophene oligomers with different emission frequencies, and where detecting fluorescence comprises simultaneously exciting the thiophene oligomers, through one or more than one emissive radiation source.

26. A conjugate comprising a thiophene oligomer according to claim 19 covalently bound to an organic molecule or to a biological molecule.